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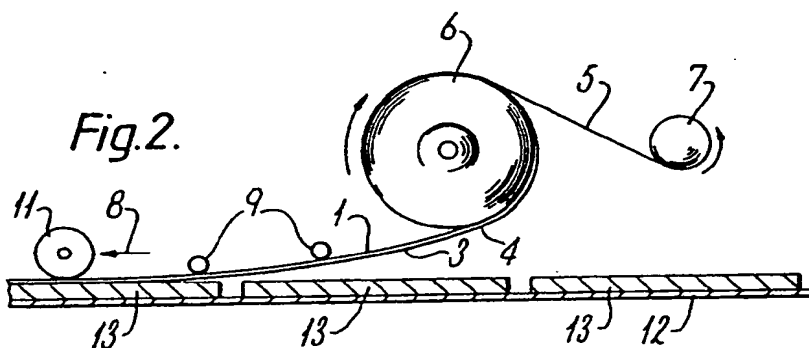
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(58) Field of search

B5N

(54) Laminated structure and method of manufacture

(57) A method of making a laminated structure employs an assembly in the form of a roll having a first layer of material 1 with a decorative finish on one face, and includes the steps of unwinding the first layer from the roll, the one face having a layer of adhesive material provided thereon, applying the one face of the first layer carrying the adhesive material to one face of a layer of translucent material 13 and causing the first layer to adhere to the layer of translucent material to form the laminated structure, whereby the decorative finish may be seen through the layer of translucent material from its other face.



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Fig.1.

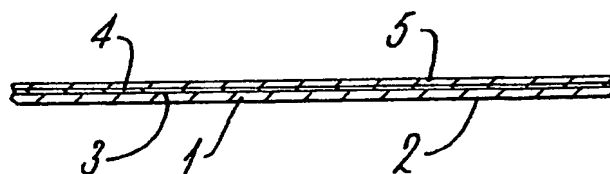


Fig.2.

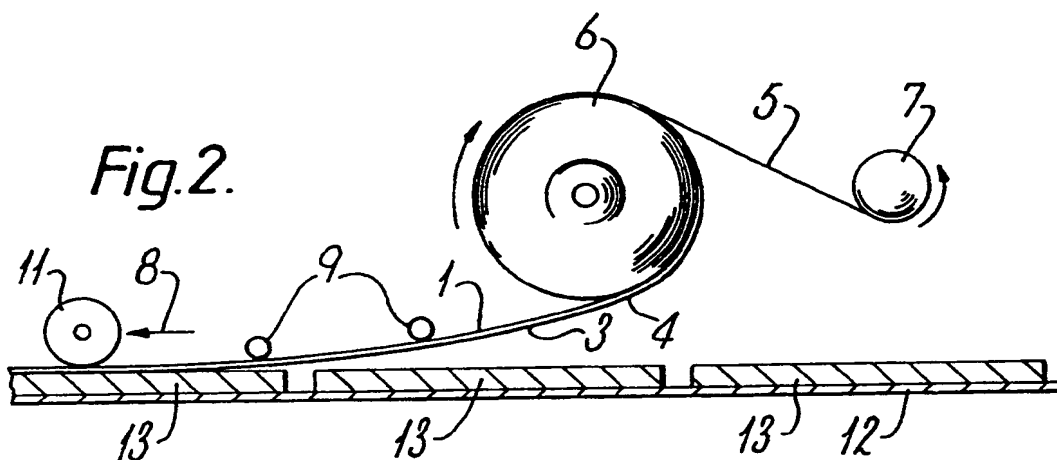
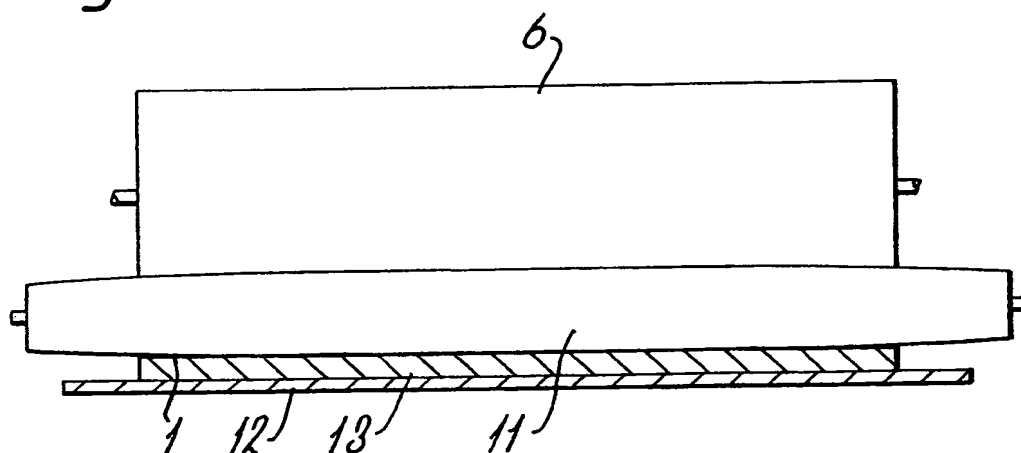


Fig.3.



SPECIFICATION

Laminated structure and method of manufacture

5 This invention relates to a method of making a laminated structure incorporating a sheet of material having a patterned or decorative surface and a sheet of transparent material, and to a laminated structure made of the materials.

10 The invention will now be described with reference to a particular embodiment in which a sheet of glass constitutes the sheet of transparent material and a sheet of melamine having a surface which simulates a wood grain constitutes the sheet of
15 material having a patterned or decorative surface, although it will be appreciated that other materials may be used.

A laminated structure made in accordance with the present invention is particularly suitable for use
20 as a sliding door in a wardrobe. Sliding doors having a wood grain surface are well known. They are usually made of plywood sheets to which a protective gloss finish has been applied.

The present invention enables a door having the
25 appearance of a sheet of wood with a high gloss finish to be provided more cheaply and easily than is possible by the present methods. In addition, it is possible to obtain a door with a higher degree of rigidity than is normal, more easily and cheaply than
30 at present. It will be understood that, in addition to doors, it is possible to make decorated panels for use in other applications by means of the present invention.

A method of making a laminated structure in
35 accordance with the present invention will now be described, by way of example, with reference to the accompanying diagrammatic drawings in which:-

Figure 1 is a cross section through a sheet of material having a decorative pattern on one surface;

40 *Figure 2* is a side view of a part of a manufacturing apparatus; and

Figure 3 is a view from one end of the arrangement shown in *Figure 2*.

Referring to *Figure 1*, there is shown a laminated
45 structure including a part of a melamine sheet 1 having a plain back 2 and a simulated wood grain front surface 3. Upon the surface 3, there is an adhesive layer 4 and, over the layer 4, there is a protective layer 5 which allows the sheet 1 with the
50 adhesive layer 4 thereon to be reeled-up. The protective layer 5 is of a well-known material which has the quality that, although it remains in contact with the surface 3 carrying the adhesive layer 4 during normal handling, it may be peeled away from
55 the sheet 1 comparatively easily, if required, in order to expose the adhesive layer 4.

Referring now to *Figure 2*, there is shown a roll 6 of the melamine sheet 1 which was described above with reference to *Figure 1*. The roll 6 is being
60 unwound by rotation in the clockwise direction, as shown, and the protective layer 5 is being peeled away and wound into a separate roll 7. The melamine sheet 1, which is unwound from the roll 6, is led in the direction of the arrow 8 beneath guide
65 rollers 9 and a pressure roller 11, with the adhesive

layer 4 on its surface 3 exposed.

Beneath the unwound sheet 1, as it is led past the rollers 9 and 11, there is a conveyor bed 12 on which there is placed a succession of glass sheets 13. The
70 roller 11 is arranged to press the melamine sheet 1 down on to the successive glass sheets 13, so that the adhesive layer 4 is pressed on to the sheets 13 and causes the melamine sheet 1 to adhere to the sheets 13. The wood grain surface 3 is thus adjacent
75 the glass sheets 13. The sheet 1 is subsequently slit along the lines between the sheets 13 and trimmed.

Referring to *Figure 3*, the roller 11 is shown in a position in which it is not exerting pressure on the glass sheet 13 beneath it. It can be seen from this
80 illustration that the roller 11 is slightly domed across its width. As a result of this dome shape, the pressure exerted along the centre lines of the glass sheets 13 by the roller 11 is greater at the centre than at the edges of the sheets 13 parallel to the centre
85 lines. By this means, air is progressively excluded from the space between the glass and the sheet 1, and the possibility of air bubbles occurring in the space is reduced.

Although the invention has been described by way
90 of example, with reference to a particular embodiment, it will be appreciated that variations and modifications can be made within the scope of the invention.

For example, instead of a roller 11 and a continuously moving conveyor bed 12, it is possible to
95 use a conveyor having an intermittent movement and to employ a press having a domed face plate to press the sheet 1 on to the individual sheets 13. It will also be appreciated that other patterned materials
100 than melamine, for example paper, may be used to provide the sheet 1. It is also possible to strengthen the laminated structure by applying a further layer on the plain back of the sheet 1.

It will also be appreciated that it is not essential to
105 employ a protective layer 5. It is possible for an adhesive layer 4 to be applied to the surface 3 of the sheet 1 as it is unrolled from the roll 6 instead of using a layer 5 to protect an adhesive layer.

Furthermore, although only one roll 6 has been
110 illustrated it is possible to employ a number of rolls 6, arranged to supply parallel sheets 1 to a glass sheet, thereby enabling a greater width to be covered in one operation.

In the particular embodiment described above, the
115 glass sheets 13 and the sheet 1 move together with equal linear speeds between 30-35 feet per minute as they pass beneath the roller 11, which exerts a pressure upon them both of at least 400 lbs per square inch.

The width of the roll 6 is 48 inches and an acrylic resin, which is a fully cured, high tack ultra-violet resistant resin, constitutes the layer 4. The sheet 1
120 may be of any suitable material. A polyester material has been found to be very suitable. It is possible to apply a backing layer to the glass sheets 13, in order to give better stability to the sheets 13. It is also possible to apply a further layer of transparent material over the sheet 1, either at the same time as the sheet 1 is applied to the glass sheets 13 or
125 subsequently in order to provide additional strength,

should that be necessary.

It will be understood that, by means of the arrangement described, not only is it possible to give a decorative effect in a simple manner to a sheet of glass or other transparent material, but to strengthen the material at the same time.

CLAIMS

1. A method of making a laminated structure in which there is employed an assembly in the form of a roll which includes a first layer of material having a decorative finish on one face, including the steps of unwinding the first layer from the roll, the one face having a layer of adhesive material provided thereon, applying the one face of the first layer carrying the adhesive material to one face of a layer of translucent material and causing the first layer to adhere to the layer of translucent material to form the laminated structure, whereby the decorative finish may be seen through the layer of translucent material from its other face.
2. A method as claimed in claim 1 in which the adhesive layer is applied to the one face as the roll is unwound.
3. A method as claimed in claim 1 in which the assembly in the form of a roll includes the layer of adhesive material on the one face and a protective layer on the adhesive layer, including the step of removing the protective layer from the assembly as the roll is unwound in order to expose the adhesive layer before the one face of the first layer is applied to the one face of the layer of translucent material.
4. A method as claimed in either claim 1 or claim 2 in which the layer of translucent material is a sheet of transparent material, including the steps of transporting the sheet of transparent material on a conveyor, applying the one face of the first layer to the one face of the sheet on the conveyor and applying pressure between the sheet and the first layer to cause the first layer to adhere to the one face of the sheet.
5. A method as claimed in claim 3 in which the conveyor moves continuously as the one face of the first layer is applied to the one face of the sheet and the pressure is applied by means of a roller which extends transversely with respect to the length of the conveyor and which has a greater diameter at its centre than at its ends.
6. A laminated structure when made by a method as claimed in any one of the preceding claims.
7. A method of making a laminated structure as claimed in claim 1 substantially as described herein with reference to the accompanying drawings.